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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/773,975 | 02/06/2004 | Hans Hurt | MAIKP117US | 7126 |
| 29393 | 7590 | 02/22/2005 | EXAMINER | |
| ESCHWEILER & ASSOCIATES, LLC NATIONAL CITY BANK BUILDING 629 EUCLID AVE., SUITE 1210 CLEVELAND, OH 44114 | | | PAREKH, NITIN | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2811 | |

DATE MAILED: 02/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|----------------------------|--|
| Office Action Summary | Application No. 10/773,975 | Applicant(s) HURT ET AL | |
| | Examiner Nitin Parekh | Art Unit 2811 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6, 8-12, 14-16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Masumoto et al. (US Pat. 5176366).

Regarding claims 1 and 3-6, Masumoto et al. disclose a lead frame/metal support (see 40 in Fig. 12) for the bonding of electrical components, the leadframe/metal support

comprising:

- a receiving pad/mounting pad (10 in Fig. 12) for placement of an electrical component thereon
- a plurality/multiplicity of electrically conducting leadframe leads/contact legs each having a first end extending toward the receiving pad/mounting pad and a second end extending away therefrom (see 4a and 4b respectively in Fig. 12),
- the leads/contact legs being respectively electrically connected to one end of a bonding wire for the bonding of the electrical component at a bonding region on

respective inner leads/contact legs (not numerically referenced in Fig. 12- see connections of the bonding wire 9 on the component 7 in Fig. 16)

- the bonding regions of the inner leads/contact legs being arranged in a region at the tips/ends of the leads/contact legs that lie adjacent a component to be bonded (not numerically referenced in Fig. 12- see the bonding wire connections in Fig. 16), and
- an electrically non-conducting structure comprising a resin strip/web (see 30 in Fig. 12; Col. 8, lines 1-8) that mechanically interconnects the leads/contact legs including two or more leads/contact legs, wherein the resin strip/web runs substantially perpendicularly to the longitudinal direction of the leads/contact legs, the resin strip/web structure comprises a number of strips/web-shaped structure present next to one another and parallel or perpendicular to one another

(Fig. 12; Fig. 10A-16; Col. 7, line 58- Col. 9, line 25; Col. 1 and 2).

Regarding claim 2, Masumoto et al. teach the entire claimed structure as applied to claim 1 above, wherein Masumoto et al. further teach the non-conducting structure comprising an epoxy mold/resin/plastic material (Col. 8, lines 1-10), the leadframe/metal support structure with the component and the plurality/multiplicity of leads/contact legs being encapsulated in an epoxy resin (see 6 in Fig. 10A and 15; Col. 1, line 45).

Regarding claim 2, forming the plastic material do not distinguish over Masumoto et al., because only the final product/structure is relevant, not the process of forming the plastic material such as "injection molding" or "transfer molding". Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marrosi et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

Regarding claim 8, Masumoto et al. teach the entire claimed structure as applied to claims 1 and 2 above, wherein Masumoto et al. disclose the non-conducting structure and the encapsulating resin comprising the epoxy resin material such that thermal expansion of the non-conducting structure is substantially equal/comparable/adapted to that of the encapsulating resin.

Regarding claims 9, 10, 12 and 14-16, Masumoto et al. teach the entire claimed structure as applied to claims 1 and 2 above.

Regarding claim 11, Masumoto et al. teach the entire claimed structure as applied to claim 1 above, wherein the bonding pad regions of the leads/contact legs interconnected by the non-conducting structure are located between the first end and the non-conducting structure (see Fig. 12 and 16).

Regarding claim 12, forming the plastic material do not distinguish over Masumoto et al., because only the final product/structure is relevant, not the process of forming the plastic material such as "injection molding" or "transfer molding". Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marrosi et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

Regarding claim 18, Masumoto et al. teach the entire claimed structure as applied to claims 1, 8 and 9 above.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masumoto et al. (US Pat. 5176366).

Regarding claim 7, Masumoto et al. teach the entire claimed structure as applied to claims 1, 6, 9 and 16 above, except the web-shaped structures being of different lengths.

The determination of parameters including length, width, thickness, spacing, etc. of components such as leads, support bar, tie bar, die pad, etc. in leadframe packaging and interconnect technology art is a subject of routine experimentation and optimization to achieve the desired number of connections, bonding strength, support/rigidity, etc., reduced level of resin sealing defects, warpage and thermal stress, and improved reliability.

It would have been obvious to a person of ordinary skill in the art at the time invention was made to incorporate the web-shaped structures being of different lengths so that the support/rigidity in the desired regions of the leads can be achieved and the mechanical stress can be optimized in Masumoto et al's leadframe structure.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masumoto et al. (US Pat. 5176366) in view of Bauer et al. (US Pat. 2001/0042679).

Regarding claim 13, Masumoto et al. teach the entire claimed structure as applied to claims 9 and 12 above, except the plastic material consisting of polybutylene terephthalate (PBT).

Bauer et al. teach a molded package having an electrical component using a plastic molding/housing made of a material such as PBT to provide an injection molding grade plastic and the desired properties (1 in Fig. 1a; Col. 3, section 0047).

It would have been obvious to a person of ordinary skill in the art at the time invention was made to incorporate the plastic material consisting of polybutylene terephthalate as taught by Bauer et al. so that the desired properties of the plastic material can be provided, thermal stress can be reduced and the material processing can be simplified in Masumoto et al's leadframe structure.

Art Unit: 2811

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin Parekh whose telephone number is 571-272-1663. The examiner can normally be reached on 09:00AM-05:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

NP

02-16-05


NITIN PAREKH

PRIMARY EXAMINER

TECHNOLOGY CENTER 2800